science, Pasteur. The Zoological Gardens at Amsterdam are described in *Macmillan's Magazine* by Mr. C. J. Cornish; and Mr. H. W. Seton-Karr narrates in the *Century* his hunting experiences in Africa and India, referring incidentally to his discovery of palæolithic flint implements in Somaliland. An interesting account of the discovery of the American continent by the Cabots, illustrated from original documents, autograph letters and ancient maps, is contributed to *Scribner's Magazine* by the Marquis of Dufferin.

The Department of Agriculture, Brisbane, Queensland, has recently issued the second edition of "A Companion for the Queensland Student of Plant Life, and Botany Abridged," by Mr. F. M. Bailey, the Colonial Botanist. Many of the notes are given with a view to assist school teachers, and particularly those residing in the country districts, to some of the more prominent distinctive characteristics of common plants. We notice that copies of the pamphlet can be obtained free by persons interested, on application to the Under-Secretary for Agriculture, Brisbane.—A translation, by C. S. Fox, of the official "Guide to the Royal Collections of Dresden," comes to us from Albanus, of Dresden. In it will be found very full information as to the collections housed in the Museum (Zwinger), the Royal Palace, the Johanneum Museum, the Albertinum, and the Japanese Palace. It remains to be said that the Guide is very well got up.—The third report of the Commissioners of the Whitechapel Public Library and Museum has reached us, and contains much interesting matter. Science is not overlooked in Whitechapel, as the list of sixteen lectures by well-known men of science shows. The library contains, in its lending branch, 541 books dealing with natural science, and in works relating to voyages and travels 614 books. In the reference department natural science is represented by 444 works, and voyages and travels by 89. We are sorry to see that there was a falling-off in the number of readers of books dealing with the subjects mentioned, as compared with the numbers given in the preceding report.

Among official American publications relating to botanical and agricultural science recently received, are the following:—Twentieth Annual Report of the Connecticut Agricultural Experiment Station for 1896, chiefly devoted to the properties and analysis of fertilising manures; Studies on American Grasses, being Bulletin No. 8 of the U.S. Department of Agriculture, Division of Agrostology (New or little-known Grasses, by F. Lawson-Scribner; Leaf-structure of *Jouvea* and of *Eragrostis obtusiflora*, by Miss E. L. Ogden); Bulletins Nos. 141–144 of the Michigan State Agricultural College Experiment Station (Forage crops and Wheat; Small fruit trials at the College; Fruit tests at South Haven; Vegetables, old and new).

The additions to the Zoological Society's Gardens during the past week include a Syrian Bear (*Ursus syriacus*, ♀) from the hills north of Bagdad, presented by Mr. B. T. Ffinch; a Ring-tailed Coati (*Nasua rufa*) from South America, presented by Mr. J. B. Gowing; an Osprey (*Pandion haliætus*) from Aberdeenshire, presented by Major-General Russell, M.P.; a Cayman-Island Amazon (*Chrysotis caymanensis*) from the Cayman Islands, presented by Mr. C. Home Sinclair; a Blue-fronted Amazon (*Chrysotis æstiva*) from South America, presented by Mrs. Reynell; a Shag (*Phalacrocorax graculus*) British, presented by Mr. Edward Step; a Common Chameleon (*Chamæleon vulgaris*) from North Africa, presented by Miss Amy Meyer; a European Tree Frog (*Hyla aborea*) from Southern Europe, presented by Mrs. Nicolas Wood; a Bonnet Monkey (albino) (*Macacus sinicus*, ♂) from India, a Rock-hopper Penguin (*Eudyptes chrysocome*) from the Antipodes Islands, a Thick-billed Penguin (*Eudyptes pachyrhynchus*) from the Stewart Islands, a Graceful Ground Dove (*Geopelia cuneata*), two Ganga Cockatoos (*Callocephalon galeatum*) from Australia, deposited; a Dwarf Finch (*Spermestes nana*) from Madagascar, two Barred-shouldered Doves (*Geopelia humeralis*) from Australia, two Chinese Turtle Doves (*Turtur chinensis*) from India, purchased; an English Wild Bull (*Bos taurus*), two Common Blue-Birds (*Sialia wilsoni*), four White-backed Pigeons (*Columba leuconota*), two Triangular-spotted Pigeons (*Columba guinea*), a Spotted Pigeon (*Columba maculosa*), a Crested Pigeon (*Ocyphaps lophotes*), an Auriculated Dove (*Zenaida auriculata*), bred in the Gardens.

## OUR ASTRONOMICAL COLUMN.

Jupiter's Satellites.—In a previous note we referred to the period of rotation of the third satellite of Jupiter as determined by recent observations made by Mr. Douglass at the Lowell Observatory. In the current number of the *Astronomischen Nachrichten* (No. 3432) he communicates a more detailed description of the observations, together with reproductions of the surface markings, which led him to the determination of the length of the period of rotation. Attempts were at first made to discover signs of surface movement within three to five hours of continuous observation. None, however, could be detected, so that the 24-hour period had to be discarded as untenable. A large series of sketches showed that the satellite's period was nearly the same as its period of revolution, namely, 7d. 5·1h. ± 1·2h. The surface markings seem to take the form of lines, their maximum width being estimated at less than 0″·1, or 200 miles. The fourth satellite was also observed minutely, and on its surface were seen markings which are described as similar to those found on the third. Its period of rotation was also noted as being probably nearly equal to its period of revolution round its primary. Prof. W. H. Pickering's discovery of the variability in the elongation of the first satellite seems to be confirmed by Mr. Douglass, who found this satellite at the time of observation "most remarkably elongated."

The Constant of Aberration.—Mr. C. L. Doolittle has recently concluded a discussion of several observations with the object of determining the value of the constant of aberration (*Astr. Journal*, No. 406). The series of observations used possessed some special advantages for such an investigation, since the stars were distributed very uniformly throughout the twenty-four hours of right ascension, and each group was observed both morning and evening at approximately the same interval before and after midnight. In all, 107 pairs of stars were used, the series extending from 1892 October 10 to 1893 December 27: these included 1744 determinations before, and 1052 determinations after midnight. The final value obtained, namely,

20″·55 ± 0·01

seems rather high when compared with those obtained by other investigators. The following brief table brings together a few of the results previously determined.

| | | ″ |
|---|---|---|
| 1843 ... ... | Struve ... ... | 20·445 |
| 1844 ... ... | C. A. F. Peters ... | 20·503 |
| 1849 ... ... | ,, ... | 20·481 |
| 1850 ... ... | Maclear ... ... | 20·53 |
| 1861 ... ... | Main ... ... | 20·335 |
| 1882 ... ... | Downing ... ... | 20·378 |
| 1883 ... ... | Nyrén ... ... | 20·492 |
| 1888 ... ... | Küstner ... ... | 20·313 |
| 1895 ... ... | Newcomb ... ... | 20·511 |

Catalogue of 480 Stars for Zone Observations between − 20° and − 80°.—Ten years ago Prof. Auwers published a list in the *Monthly Notices* of 480 stars to serve as standards for zone observations. It was then suggested that these stars should be systematically observed at those observatories situated in southern latitudes. Sufficient material has, however, been obtained to enable Prof. Auwers to publish in the current number of the *Astronomischen Nachrichten* (No. 3431–32) a complete catalogue of the positions of these 480 stars, together with a selection of nineteen other southern fundamental stars. Prof. Auwers mentions, however, that we must not treat the

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places of all these stars as if they were as accurately determined as fundamental stars should be, because there was not in some cases sufficient material for the determinations of accurate proper motions. It is suggested that after an interval of fifteen to twenty years these stars should be again systematically observed and computed afresh. The catalogue, which is arranged for the epoch 1900, further contains the values of Bessel's constants computed for that year. There is also added the places of twenty-four stars, lying near the south pole, which have been chosen by Dr. Gill, and observed at the Cape Observatory.

**Latitude Observations at the U.S. Naval Observatory, Washington.**—Prof. W. Harkness describes the results of a determination of the latitude, and its observed variation, of the Washington Observatory in the *Astronomical Journal* (No. 404). The method employed involved the use of two instruments, namely, the transit instrument, of 77 inches focal length and 4·86 inches aperture in the prime vertical, and the meridian instrument of 30 inches focal length and 2·55 inches aperture; the latter could be used either as a transit instrument or as a zenith-telescope. The plan of work adopted was to observe α Lyræ at every possible culmination, both night and day, throughout the year, and also to observe four other stars near the times of their maximum aberration, in order to eliminate the latter constant from the latitude variation. The final result of the investigation is given in a table showing the observed values of the variation of the latitude.

**Appearance of D'Arrest's Comet.**—A communication from America informs us that Prof. Holden telegraphs that D'Arrest's comet was observed by Perrine June 28·9764 Greenwich mean time. Apparent R.A. 30° 21′ 9″. Apparent polar distance 83° 46′ 29″. The ephemeris, which was given in *Ast. Nachr.*, No. 3405, requires the correction, according to Prof. Kreuz, of − 3m. 58s. in R.A. and − 4′·4 in declination.

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## *SPECIES OR SUBSPECIES?*

Of late attention has frequently been called in scientific journals to that rapid multiplication of nominal species of mammals which forms one of the most striking features of the systematic zoology of the last few years. To take an extreme instance: In eastern Europe and northern Asia there exists a pretty little rodent allied to the squirrels, and forming the single Old World representative of the genus *Tamias*. Until quite recently this creature was supposed to be common to North America, and was generally known as the Asiatic Chipmunk (*T. asiaticus*); and it is not many years ago that a well-known American zoologist fully recognised the specific identity of the eastern and western forms. Soon afterwards, that very same writer not only separated the American from the Asiatic race, but considered that the former constituted more than a score of distinct species! To take another example. The coyoté, or prairie wolf, has been very generally recognised as constituting a well-marked species distinguished from the ordinary wolf, not only by its inferior size, but by differences of colour and pelage. During the present year Dr. C. H. Merriam, the well-known Government zoologist of the United States, has, however, thought proper to split up the coyoté into a number of what he regards as distinct species. And it may be added that he has done the same for the brown and grizzly bears of his own continent, and also for those of north-eastern Asia.

It is, perhaps, needless to say that this species multiplication is a direct consequence of the increased attention which has been given of late years to the collection and description of mammals; and that, so far as the actual work itself is concerned, we have nothing but praise to bestow on the workers. Every one will admit that we ought to know as much as possible about all animals, and that if an American bear, wolf, or stoat can be distinguished from its cousin of the Old World, it is right and proper that the differences should be duly recorded. But is it right or advisable to bestow distinct specific names on animals so near to one another that it often requires the aid of a specialist to distinguish the one from the other? No one will deny that the lion and the tiger constitute a couple of well-marked species of the genus *Felis*. If, however, we trace the Indian tiger westwards into Persia and northwards into Central Asia, we find that it gradually assumes a longer coat, and either increases or decreases in size. Consequently, some zoologists regard the Siberian (and, for what I know, the Persian) tiger as a species distinct from the royal tiger of Bengal. Apart from the question whether the two intergrade in the intermediate area, if this view be adopted, we have now three species instead of two to deal with, namely the lion, the Bengal tiger, and the Siberian tiger; but it will be obvious that the two last differ from one another much less markedly than they both do from the first. If we only use English names, no very great harm is done, for we still see that two forms are tigers, while the other is a lion. In scientific nomenclature the case is, however, different, for each form receives a distinct specific name under the generic title of *Felis;* and hence there is no means of knowing by the nomenclature alone that two of the three are intimately related, while the other is widely different. Consequently, when we meet with the names *Felis tigris* and, say, *Felis sibirica*, and are told that the former is confined to India, we lose sight of the very important fcat that essentially the same type of animal ranges from Ceylon and India to the arctic tundras of Siberia; the difference in the length and thickness of its fur being obviously adaptations to its different climatic surroundings.

Precisely analogous instances occur in the case of the wolves and bears. The wolf of Europe is closely allied to the large American wolf, and very distinct from the coyoté, but if we separate the European wolf as one species, make several of the large American wolves, and several more of the coyoté, we have no clue to their mutual resemblances or differences; and we thus miss much important information about geographical distribution which ought to be apparent at first sight. Take, again, the deer allied to the red deer. The latter (*Cervus elaphus*) is a very distinct species confined to the Old World. In America it is represented by the wapiti (*C. canadensis*), which differs in colour, voice, and the form of its antlers. But there exists in Central and North-eastern Asia a deer so closely allied to the wapiti, that from the characters of the antlers alone the two cannot be separated. Now, if we regard this deer as a distinct species, under the name of *C. eustephanus*, we have obviously no means of knowing that it is much more nearly related to the wapiti than it is to the red deer, and we also lose sight of the circumstance that whereas the group to which the latter belongs is confined to the eastern hemisphere, the wapiti group is common to the north and north-eastern portions of both hemispheres.

But this is not all. By using specific terms in a wide sense the amateur zoologist and sportsman is able to keep in touch with the working zoologist, and thus to participate largely in the more important discoveries and advances of the science; whereas when specific distinctions are made on the minute differences now in vogue, he is utterly at sea, and probably throws up the whole study. Very likely the pure systematist may say that this is a matter of no moment, although this is not our own view.

What may be called the revolt of the amateur and sporting naturalist against the undue splitting of the modern specialist, has been initiated by Mr. Theodore Roosevelt, in an article in our contemporary *Science* for April 30, under the title of "A Layman's Views on Specific Nomenclature." Mr. Roosevelt, who holds the important office of President of the Board of Police Commissioners of New York, modestly styles himself a "layman," although he is really a very accomplished field naturalist, and probably knows more about the big game of North America than any other man. In this article the arguments are temperately, but forcibly put, the author laying stress on some of the points alluded to above, and urging that in the case of closely allied forms varietal or subspecific names should be employed in place of specific ones. Thus, the Asiatic wapiti should be a subspecies of the true wapiti, when its name (*Cervus canadensis eustephanus*) would at once indicate its relationship. With regard to the use of specific names for what are essentially modifications of one and the same type of animal, Mr. Roosevelt writes as follows. "New terminology is a matter of mere convenience, and it is nothing like as important as the facts themselves. Nevertheless terminology has a certain importance of its own. It is especially important that it should not be clumsy or such as to confuse or mislead the student. Although species is a less arbitrary term than genus, still it remains true that it is more or less arbitrary. If one man chooses to consider as species what other men generally agree in treating merely as varieties, it is unfortunate, both because the word is twisted away from its common use, and

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